

Remarks

The various parts of the Office Action (and other matters, if any) are discussed below under appropriate headings.

Claim Rejections – 35 USC 103

The Examiner contends the subject-matter of claims 1 to 99 is unpatentable over Raymond et al (“Continuous Sample Pretreatment Using a Free-Flow Electrophoresis Device Integrated onto a Silicon Chip”, Analytical Chemistry, Vol 66, No 18, September 15, 1994) in view of Oakey et al (US-2003/0159999).

This is not the case. Nevertheless, in the interest of expediency, claims 1, 39 and 68, as the independent claims, are being amended so as more clearly to distinguish patentably over the disclosures of the cited prior art.

Claims 1, 39 and 68 are being amended to incorporate the subject-matter of claims 13 and 14, claims 51 and 52 and claims 82 and 83, respectively, and each now require *inter alia* a free flow electrophoresis microchip which comprises a planar separation chamber having a planar region, and a magnetic field unit for providing a magnetic field substantially orthogonal to the planar region of the separation member and to the flow direction of the separation medium.

The Examiner has cited Raymond et al as disclosing a free flow electrophoresis device.

The Examiner has acknowledged that Raymond et al does not teach a magnetic field unit as required by claims 1, 39 and 68. In this regard, the Examiner has cited Oakey et al, and specifically identified the disclosure of a field generator (92) which induces an electric or magnetic field in a microfluidic device (44) [paragraph [0058], lines 5 to 7 and Figure 3], and is alleging that it would have been obvious to the skilled person to modify the microfluidic device of Raymond et al to incorporate a field generator (92) of the kind of Oakey et al. This is absolutely not the case.

Significantly, Oakey et al teaches that the field generator (92) is a component of an imaging system (90), which is separate to the microfluidic devices (44) that are to be imaged by the imaging system (90).

The teaching of Oakey et al is to identify particles by reference to electric or magnetic properties of the particles or properties associated with a pre-treatment of the particles using the imaging system (90), which induces an electric or magnetic field in

the microfluidic device (44) to allow the particles to be imaged [paragraph [0058], lines 7 to 12]. Given this teaching, the skilled person would have had no conceivable reason to contemplate the implementation of the field generator (92) of Oakey et al within a microfluidic device, such as of the kind of Raymond et al.

This notwithstanding, it is submitted that, even if the skilled person were to have somehow contemplated applying the teaching of Oakey et al to that of Raymond et al, the microfluidic device as now defined in claims 1, 39 and 68 would not result.

In Oakey et al, the purpose of the field generator (92) is to induce lateral movement of the particles of interest across the field of view of the microscope of the imaging system (90) [paragraph [0058], lines 7 to 12 and Figure 3], so as to enable this movement to be captured and thereby enable the particles of interest to be identified.

If the field generator (92) of Oakey et al were to be incorporated into the microfluidic device of Raymond et al, which has a planar separation bed, the field generator (92) would be required to induce a field transversely across the separation bed, that is, parallel to the separation bed and not substantially orthogonal to the planar separation bed as now required by claims 1, 39 and 68, in order to induce lateral movement of the particles of interest across the field of view of the microscope of the imaging system (90).

Entirely differently from Oakey et al, the magnetic field employed in the microfluidic device of present claims 1, 39 and 68 is required to be orthogonal to the planar region of the separation chamber, in order to induce either a magnetohydrodynamic flow when provided in conjunction with an electric field or an electric field transverse to the separation chamber when provided in conjunction with a supplied flow through the separation chamber.

Accordingly, it is submitted that the subject-matter of claims 1, 39 and 68 is patentably distinguished over the disclosures of Raymond et al and Oakey et al.

With regard to the remaining dependent claims (claims 2 to 12, 15 to 38, 40 to 50, 53 to 67, 69 to 81 and 84 to 99), it is submitted that these claims are dependent upon allowable independent claims (claims 1, 39 and 68), and, as such, are themselves allowable; dependent claims 13, 14, 51, 52, 82 and 83 having been cancelled. Inasmuch as the dependent claims are allowable for at least the same reasons as the claims from which they depend, the Examiner's comments in respect thereof need not be addressed and this should not be construed to be an acquiescence in the contentions made by the Examiner.

Conclusion

In view of the foregoing, request is made for timely issuance of a notice of allowance.

Respectfully submitted,

RENNER, OTTO, BOISSELLE & SKLAR, LLP

/Don W. Bulson/

By _____
Don W. Bulson, Reg. No. 28,192

1621 Euclid Avenue
Nineteenth Floor
Cleveland, Ohio 44115
(216) 621-1113

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